

WHAT IS CLAIMED IS:

1. A process for the reliable operation of turbocompressors with surge limit control and a surge limit control valve, wherein the compressor delivers gases with different compositions and the composition of the gas (molecular weight) affects the performance characteristic of the turbocompressor and consequently the position of the surge limit in the performance

5 characteristic, the process comprising:

compensating the effect on the position of the surge limit and hence also on the position of the surge limit control line based on different compositions of the gases by using predetermined design values for the gas constant R , the isentropic exponent k and the compressibility number z within the surge limit control for determining the delivery head Δh and the volume flow V and
10 plotted in the form of a predetermined surge limit within the surge limit control; and

determining the set point and the actual value for the surge limit control from the graph plotted in the form of a predetermined surge limit; and

operating the compressor with the determined set points and actual values for the surge limit control with a minimally necessary distance from the surge limit.

2. A process in accordance with claim 1, further comprising:

plotting a number of characteristics with constant speed or with constant geometry including one or more of guide vane position or position of a throttling fitting, wherein a family of curves is described with surge limit control lines for a constant speed or constant compressor
5 geometry, and that interpolation is performed between the different curves and the surge limit

control line is correctly determined at each speed or compressor geometry, and the surge limiter is operated with the minimally necessary distance from the surge limit.

3. A process in accordance with claim 1, further comprising:

plotting a single "fictitious" control line, whose position depends on the performance characteristic and is determined by the surge points located farthest to the right and the surge limiter is operated with the minimally necessary distance from the surge limit.

4. A process for the reliable operation of turbocompressors with a surge limit control and a surge limit control valve, wherein the compressor delivers gases with different compositions and the composition of the individual gases (molecular weight) leaves the performance characteristic of the turbocompressor and hence the position of the surge limit in the performance characteristic unaffected, the process comprising:

using a predetermined design value for the gas constant R , the isentropic exponent k and the compressibility number z within the surge limit control for the determination of the delivery head Δh and the volume flow V and plotted in the form of a predetermined surge limit within the surge limit control;

determining the set point and the actual value for the surge limit control from the graph plotted with the predetermined surge limit; and

operating the compressor with the determined set points and actual values for the surge limit control with a minimally necessary distance from the surge limit.